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(54) **REINFORCED DOCTOR BLADE ASSEMBLY SEAL AND PRINTER CARTRIDGE EMPLOYING THE REINFORCED SEAL**

VERSTÄRKTE ABDICHTUNG FÜR EINE RAKELANORDNUNG SOWIE DRUCKERPATRONE MIT DER VERSTÄRKTEN ABDICHTUNG

JOINT D'ÉTANCHÉITÉ RENFORCÉ POUR ENSEMBLE RACLE ET CARTOUCHE D'IMPRIMANTE METTANT EN UVRE LE JOINT D'ÉTANCHÉITÉ RENFORCÉ

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Description

FIELD OF THE INVENTION

[0001] The present invention relates generally to an image forming device and, more particularly, to a reinforced doctor blade assembly seal and a printer cartridge employing the reinforced seal.

DESCRIPTION OF THE RELATED ART

[0002] An image forming device, such as a laser printer and the like, includes a drum having a photoconductive outer cylindrical surface charged to a uniform electrical potential and then selectively exposed to light in a pattern corresponding to an original image. Those areas of the photoconductive surface exposed to light are discharged thus forming a latent electrostatic image thereon. A developer material, such as toner, having an electrical charge such that the toner is attracted to the discharged area of the photoconductive surface operates in contact with the photoconductive surface. The drum developed image then rotates toward a transfer station. A recording sheet is then brought into contact with the photoconductor and the toner thereon is transferred to the recording sheet in the form of the latent electrostatic image. The recording sheet is then heated, permanently fusing the toner to the sheet. In preparation for the next image forming cycle, the photoconductive surface of the drum is cleaned of residual toner and recharged. U.S. Pat. No. 6,990,308, assigned to the assignee of the present invention, discloses an image forming device having the aforementioned configuration. The disclosure of this patent is hereby incorporated herein by reference thereto.

[0003] Typically, as seen in the cited patent, the toner is stored in a toner well or reservoir of a printer cartridge located adjacent to the drum. A doctor blade assembly and a developer roll of a developer unit, which is part of the printer cartridge, are positioned between the toner reservoir and the drum for controlling the amount of toner delivered to the drum. A nip created between the doctor blade of the doctor blade assembly and the developer roll controls the thickness of the toner layer formed on the developer roll. To be able to print correctly, toner must be evenly distributed, or doctored, out in a thin uniform layer onto the developer roll in the proper thickness. This function is performed by the doctor blade.

[0004] Referring to FIGS. 1, 2A and 2B herein, there is partially shown in FIGS. 2A and 2B the printer cartridge 10 in which a seal 12 in the form of an elongated strip of a flexible plastic film is positioned between the doctor blade assembly 14 and a portion of a housing 16 of the printer cartridge 10. The housing portion is in the form of a corner 16a on the housing 16. The strip of film comprising the seal 12, shown by itself in FIG. 1, is a bi-axially-oriented PET (boPET) polyester film material, marketed under the trademark Mylar. It is positioned in a space or gap 18 between the doctor blade assembly 14 and the corner 16a on the cartridge housing 16 in order to prevent leaking of toner from between these components through this gap 18. Referring to FIG. 1 herein, this seal, generally designated 12, is shown by itself. In FIG. 2A the seal 12 is shown correctly installed and positioned in the printer cartridge 10, closing the gap 18 between a bracket 20 of the doctor blade assembly 14 and the housing 16 of the printer cartridge 10.

[0005] The developer roll 22, a toner adder roll 24 and the doctor blade assembly 14, with the doctor blade 26 mounted by the bracket 20, make up the developer unit 28 and are mounted on the housing 16 of the printer cartridge 10, as shown in FIGS. 2A and 2B. The quantity of toner in the toner reservoir of the printer cartridge 10 is depleted through use in the printing operation. Thus the printer cartridge 10 is a consumable item which must be replaced periodically in the image forming device. Being a consumable, the printer cartridge 10 must be designed and manufactured to withstand rough handling during shipping, separate from the printer, through the supply chain to a customer and installation into an image forming device. The printer cartridge 10 has the potential to be dropped and thus exposed to large shock forces during shipping separate from the printer.

[0006] Dropping the printer cartridge 10 can lead to excessive toner leaks from behind the doctor blade assembly bracket 20 due to internal pressure forcing the doctor blade assembly seal 12 to blow out and dislocate from its correct sealing position, as seen in FIG. 2A, to the blown-out position, as seen in FIG. 2B. A photograph of the blown-out position of the seal 12 replicated by a drop test is shown in FIG. 2C. This blow out and dislocation of the seal 12 causes two problems. First, when the seal 12 is pushed out over the doctor blade assembly 14 as shown in FIG. 2C, its sealing integrity is lost and toner can easily leak from the printer cartridge 10. Second, as shown in FIG. 2B the seal 10 may assume a wedged condition upstream of the gap 18 and on top of the doctor blade assembly 14 where it applies increased downward force onto the doctor blade 26, adversely affecting the doctoring performance of the doctor blade 26.

[0007] One proposed solution for avoidance of the blow out problem has been to use a seal in the form of a strip of foam material, rather than of the boPET polyester material, behind the doctor blade assembly. However, the presence of the foam tends to prevent the doctor blade 26 from translating smoothly against the developer roll 22. Also, the foam causes more leak paths to propagate than the boPET polyester seal, requiring the application of wax to fill the anticipated leak paths.

[0008] US 2008/0145093 A1 discloses a secure seal provided between a blade unit and a housing in a developer unit of an image forming apparatus by utilizing a sheet member configured to cover a step height formed on a surface of the blade unit facing a sealing member.

[0009] US 5 080 745 discloses a seal for temporarily sealing a toner bin having a container opening, a sealing surface formed around the container opening, and a con-

tainer cover structure connected to the container over the container opening so as to form a narrow slot exposed along one side of the toner in at a slot opening. The seal includes a sealing sheet adapted to be inserted through the slot opening in an inserted position in which the sealing sheet completely covers the container opening and a portion of the container sealing surface around the entire perimeter of the container opening. The sealing sheet includes an adhesive coating positioned on a sealing side thereof, and has an insertion edge at one end and a trailing edge at its opposite end.

[0010] US 3 436 297 A discloses an enhanced vinyl stripping which may be readily attached by dielectric sealing to base surfaces. In a preferred form, the stripping comprises recesses or grooves on the interior face of the stripping so as to provide an area into which the plastic may flow upon dielectric sealing.

[0011] Thus, there is a continuing need for an innovation that will provide effective sealing between the doctor blade assembly and the housing of the printer cartridge.

SUMMARY OF THE INVENTION

[0012] Accordingly, the present invention provides a reinforced doctor blade assembly seal, and a printer cartridge employing said reinforced assembly seal as defined in the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] Reference will now be made to the accompanying drawings, which are not necessarily drawn to scale and in some instances portions may be exaggerated in order to emphasize features of the invention, and wherein:

FIG. 1 is a perspective view of a prior art doctor blade assembly seal.

FIG. 2A is a side elevational view of a portion of a printer cartridge depicting correct positioning of the prior art seal of FIG. 1 in a gap between a doctor blade assembly and a corner on a housing of the printer cartridge.

FIG. 2B is a view similar to that of FIG. 2A but now showing the prior art seal of FIG. 1 dislocated to a blown-out position in which it assumes a wedged condition on top of the doctor blade assembly.

FIG. 2C is a photograph of a blown-out doctor blade assembly seal.

FIG. 3 is a perspective view an exemplary embodiment of a reinforced seal of the present invention.

FIG. 4 is an enlarged cross-sectional view of the reinforced seal taken along line 4-4 of FIG. 3.

FIG. 5 is an enlarged fragmentary cross-sectional view of the reinforced seal extending in the sealing relationship in the gap between the doctor blade assembly and a corner portion on the printer cartridge housing.

DETAILED DESCRIPTION

[0014] The present invention now will be described more fully hereinafter with reference to the accompanying drawings, in which some, but not all embodiments of the invention are shown. Indeed, the invention may be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather, these embodiments are provided so that this disclosure will satisfy applicable legal requirements. Like numerals refer to like elements throughout the views.

[0015] Referring now to FIGS. 3-5, there is illustrated an exemplary embodiment of a reinforced seal of the present invention, generally designated 30, for sealably closing the gap 18 between the doctor blade assembly 14 and the housing 16 of the printer cartridge 10. The reinforced seal 30 basically has partially a single layered construction and partially a two layered, laminated construction, comprised of an elongated base strip 32 of a flexible plastic film and an elongated supplemental strip 34 of a flexible plastic film smaller in size than the base strip 32 and laminated, such as by being adhesively attached, on the base strip 32. The material comprising the flexible plastic film of both strips 32, 34, while not necessarily so limited, may be the same, a bi-axially-oriented polyethylene terephthalate (PET) polyester, or boPET polyester, which is also the same material used in the prior art seal of FIG. 1.

[0016] Both the base and supplemental strips 32, 34 of the reinforced seal 30 have polygonal configurations, preferably each rectangular in shape. The strips 32, 34 have respective surfaces 32a, 34a of predetermined areas bounded by multiple edges 32b-32e, 34b-34e, respectively, correspondingly adjacently positioned in spaced apart relationship to each other. In the exemplary embodiment illustrated in FIG. 3, the multiple edges 32b-32e and 34b-34e on the respective base and supplemental strips 32, 34 preferably are four in number. The area of the surface 32a of the base strip 32 is larger than the area of the surface 34a of the supplemental strip 34 such that the surface 32a of the base strip 32 has a U-shaped configuration and borders the supplemental strip 34 at a plurality, namely three, of its edges 34c-34e. The base strip 32 is thus provided with adjacent laminated and non-laminated portions, generally designated 36, 38, along opposite sides of a foldable region F (as represented by a dashed line) extending between one pair of edges 32c, 32d of the base strip 32 and spaced from and intermediately between another pair of edges 32b, 32e of the base strip 32. The base and supplemental strips 32, 34 are substantially aligned with one another along their respective one edges 32b, 34b.

[0017] The supplemental strip 34 is shorter in length and width than the base strip 32. The strips 32, 34 are relatively narrow in configuration with their respective lengths being much longer or larger than their widths. The U-shaped surface 32a of the base strip 32 further has a U-shaped outer portion 40 and a U-shaped inner portion 42 such that the U-shaped inner portion 42 bounds the plurality, namely three, of the multiple edges 34b-34e of the supplemental strip 34. The U-shaped outer portion 40 has an attaching mechanism, such as an adhesive coating 44, thereon and contains the foldable region F which is aligned with the gap 18 when the reinforced seal 30 is installed as shown in FIG. 5. The foldable or flexible region F per se is at approximately the same position as it was on the prior art seal shown in FIG. 1.

[0018] The base strip 32 has a thickness of approximately 0.051 mm, the same as the prior art seal 12. The supplemental strip 34 has a thickness of approximately 0.19 mm which is within a range of from three to four times the thickness of the base strip 32. The thickness of the base strip 32 provides sufficient flexure stiffness needed to press the non-laminated portion 38 of the base strip 32 of the reinforced seal 30 and the adhesive coating 44 thereon against an outside surface 16b of the housing 16 above the gap 18 with the supplemental strip 34 located below the gap 18 so as to prevent potential leakage of toner along the path of flow as represented by arrow 46 through the gap 18, as best seen in FIG. 5. The adhesive coating 44 on the base strip 32 enables it, the same as in the case of the prior art seal 12, to stick to the outside surface 16b of the housing 16, as shown in FIG. 2A.

[0019] Thus, the supplemental strip 34 is laminated on the base strip 32 as described above such that when the reinforced seal 30 is installed on the outside surface 16b of the housing 16 the adhesively-coated area of the base strip 32 alone extends above the corner 16a on the housing 16 where the base strip 32 adheres to the housing 16 while the supplemental strip 34 is located below the housing corner 16a. The foldable region F defined on the base strip 32 of the reinforced seal 30 is contiguous with the corner 16a of the housing 16 where the seal 30 is bent when in its installed position, as depicted in FIG. 5. Thus, the supplemental strip 34 does not come into any significant contact, if any, with the corner 16a nor cause any unintended repositioning of the doctor blade assembly 14. The supplemental strip 34 being laminated to the base strip 32 sufficiently stiffens and reinforces the partially laminated seal 30 of the present invention such that the shock load needed to cause a seal failure is now higher than the printer cartridge 10 is likely to experience during handling and shipping. The thickness of the reinforced seal 30 through the base and supplemental strips 32, 34 of the laminated portion 36 is greater than the width of the gap 18 which deters blow out of the reinforced seal 30 outward through the gap 18. As a result, the reinforced seal 30 is much more resistant to blowing out over the doctor blade assembly 14. Also, with this added stiffness or rigidity, the ease of installation of the reinforced seal 30 is also increased. Before the rigidity of the laminated construction was added, the entire length of the prior art seal 12 deflected under its own weight. Now, with the reinforced seal 30 being partially laminated construction, once the non-laminated portion 38 of the reinforced seal 30 is properly placed onto the housing 16, with the adhesive-covered opposite end portions 30a of the seal 30 overlapping J-seals 48 located at the opposite ends of the doctor blade assembly 14 and the developer roll 22, the middle unsupported laminated portion 36 of the reinforced seal 30 holds its generally planar shape due to the reinforcing presence of the supplemental strip 34 allowing for more precise placement of the reinforced seal 30 when being secured to the housing 16 of the printer cartridge 10.

[0020] The reinforced seal 30 tailors the solution provided by the present invention to meet the constraints of the problem that is faced. For example, merely increasing the thickness of the entire prior art seal 12 would not alleviate the problem. While a thicker boPET polyester film of the prior art seal 12 would be less prone to flexing when exposed to shock loads, it must not be so thick that the seal would yield and crease, as the thicker seal would do, when it is placed behind the doctor blade assembly. Just using a thicker seal is also not feasible because opposite end portions that overlap the J-seals 48 must remain thinner than the remainder of the seal to prevent a leak path across the J-seals 48 located adjacent the opposite end portions of the seal and so as not to dislocate the positioning of the doctor blade nip. In order to prevent the prior art seal 12 from creasing while positioned behind the doctor blade assembly 14, the prior art seal 12 to be effective would have to be provided with a variable thickness like the reinforced seal 30. Thus, it can be readily understood that the partial laminated construction of the reinforced seal 30 is tailored to address and satisfy all these design constraints without causing unintended adverse consequences.

[0021] The foregoing description of several embodiments of the invention has been presented for purposes of illustration. It is not intended to be exhaustive or to limit the invention to the precise forms disclosed, and obviously many modifications and variations are possible in light of the above teaching. It is intended that the scope of the invention be defined by the claims appended hereto.

Claims

1. A reinforced doctor blade assembly seal (30), comprising:

   a base strip (32) of a flexible plastic film having a thickness, a surface (32a) of predetermined area bounded by multiple edges (32b-32e), and a foldable region (F) extending length-wise of

said base strip between one pair (32c, 32d) of said multiple edges and spaced from and located intermediately between another pair (32b, 32e) of said multiple edges;
a supplemental strip (34) of a flexible plastic film having a thickness and a surface (34a) of predetermined area bounded by multiple edges (34b-34e) and being laminated onto said flexible plastic film of said base strip (32) offset from and along one side of said foldable region on said base strip (32) such that said base strip (32) has laminated (36) and non-laminated (38) portions along opposite sides of said foldable region (F) with the thickness of the laminated portion (36) being greater than the thickness of the non-laminated portion (38); and
an adhesive layer (44) on at least a section of said non-laminated portion (38) of said base strip (32) extending between said one pair of multiple edges of said base strip (32);
characterized in that said multiple edges of said base strip (32) that correspond to said multiple edges of said supplemental strip (34) are greater in length respectively than said multiple edges of said supplemental strip (34) such that said surface of said base strip (32) is substantially U-shaped and borders said supplemental strip (34) along a plurality of said multiple edges of said supplemental strip (34).

2. The seal of claim 1 wherein said thickness of said supplemental strip (34) is within a range of from three to four times greater than said thickness of said base strip (32).

3. The seal of claim 1 wherein said flexible plastic film of said supplemental strip (34) is a bi-axially-oriented PET polyester and said flexible plastic film of said base strip (32) is a bi-axially-oriented PET polyester.

4. The seal of claim 1 wherein said predetermined area of said surface (32a) of said base strip (32) is larger than said predetermined area of said surface (34a) of said supplemental strip (34).

5. The seal of claim 1 wherein one of said multiple edges of said supplemental strip (34) is substantially aligned along one of said multiple edges of said base strip (32).

6. The seal of claim 5 wherein said U-shaped surface on said base strip (32) has a U-shaped outer portion (40) and a U-shaped inner portion (42) such that said U-shaped inner portion (42) bounds said plurality of said multiple edges of said supplemental strip (34).

7. The seal of claim 6 wherein said U-shaped outer portion (40) is spaced from said plurality of said multiple edges of said supplemental strip (34).

8. The seal of claim 6 wherein said U-shaped surface of said base strip (32) has said foldable region (F) in said U-shaped outer portion (40) thereof and spaced from said U-shaped inner portion (42) thereof.

9. A printer cartridge (10), comprising:

a housing (16) having a reservoir for holding toner;
a developer roll (22) supported by said housing (16) and operable to receive toner from said reservoir and transfer the toner to a photoconductive drum;
a doctor blade assembly supported by said housing adjacent to said developer roll and having a doctor blade and a bracket for positioning said doctor blade to form a nip with said developer roll to control the amount of toner metered onto said developer roll, said bracket also disposed adjacent a portion of said housing such that a gap is defined between said bracket and said housing portion;

wherein the doctor blade assembly comprises a reinforced seal (30) as claimed in Claim 1 disposed through said gap to provide sealing of said gap between said bracket and said housing portion to prevent potential leakage of toner in a predetermined direction of flow through said gap and from said printer cartridge,

wherein the laminated portion (36) of the base strip (32) being located upstream of said gap relative to the direction of potential toner leakage flow and the non-laminated portion (38) of the base strip (32) being located through said gap and downstream of said gap relative to the direction of potential toner leakage flow,
and wherein the adhesive layer (44) on at least a portion of the surface on the non-laminated portion (38) of the base strip (32) adapting attachment of said reinforced seal (30) at the non-laminated portion (38) of said base strip (32) to said housing at least downstream of said gap.

10. The cartridge of claim 9 wherein the thickness of the supplemental strip (34) is within a range of from three to four times greater than the thickness of the base strip (32).

11. The cartridge of claim 9 wherein the flexible plastic

film of the supplemental strip (34) is a bi-axially-oriented PET polyester and the flexible plastic film of the base strip (32) is a bi-axially-oriented PET polyester

12. The cartridge of claim 9 wherein the U-shaped surface on the base strip (32) has a U-shaped outer portion (40) and a U-shaped inner portion (42) such that the U-shaped inner portion (42) bounds the plurality of said multiple edges of the supplemental strip (34).

13. The cartridge of claim 12 wherein the U-shaped surface of the base strip (32) has the foldable region (F) aligned with the gap and defined in the U-shaped outer portion (40) of the base strip (32) and spaced from the U-shaped inner portion (42) thereof and the adhesive layer (44) is on the U-shaped outer portion (40) of the base strip (32).

Patentansprüche

1. Eine verstärkte Abdichtung (30) für eine Rakelanordnung, beinhaltend:

einen Basisstreifen (32) aus einer flexiblen Kunststofffolie mit einer Dicke, einer von mehreren Rändern (32b-32e) umgrenzten Oberfläche (32a) einer zuvor bestimmten Fläche und einer faltbaren Region (F), die sich zwischen einem Paar (32c, 32d) der mehreren Ränder in der Längsrichtung des Basisstreifens erstreckt und von einem anderen Paar (32b, 32e) der mehreren Ränder beabstandet ist und zwischen diesem eingerichtet ist;
einen Zusatzstreifen (34) aus einer flexiblen Kunststofffolie mit einer Dicke und einer von mehreren Rändern (34b-34e) umgrenzten Oberfläche (34a) einer zuvor bestimmten Fläche, und der versetzt von und entlang einer Seite der faltbaren Region auf dem Basisstreifen (32) auf die flexible Kunststofffolie des Basisstreifens (32) laminiert ist, so dass der Basisstreifen (32) entlang gegenüberliegenden Seiten der faltbaren Region (F) einen laminierten (36) und einen nicht laminierten (38) Abschnitt aufweist, wobei die Dicke des laminierten Abschnitts (36) größer als die Dicke des nicht laminierten Abschnitts (38) ist; und
eine Klebschicht (44) auf mindestens einem Teilabschnitt des nicht laminierten Abschnitts (38) des Basisstreifens (32), der sich zwischen dem einen Paar mehrerer Ränder des Basisstreifens (32) erstreckt;
dadurch gekennzeichnet, dass die mehreren Ränder des Basisstreifens (32), die den mehreren Rändern des Zusatzstreifens (34) entsprechen, jeweils eine größere Länge als die mehreren Ränder des Zusatzstreifens (34) aufweisen, so dass die Oberfläche des Basisstreifens (32) im Wesentlichen U-förmig ist und entlang einer Vielzahl der mehreren Ränder des Zusatzstreifens (34) an den Zusatzstreifen (34) angrenzt.

2. Abdichtung gemäß Anspruch 1, wobei die Dicke des Zusatzstreifens (34) zwischen drei- und viermal größer als die Dicke des Basisstreifens (32) ist.

3. Abdichtung gemäß Anspruch 1, wobei die flexible Kunststofffolie des Zusatzstreifens (34) ein biaxial orientierter PET-Polyester ist und die flexible Kunststofffolie des Basisstreifens (32) ein biaxial orientierter PET-Polyester ist.

4. Abdichtung gemäß Anspruch 1, wobei die zuvor bestimmte Fläche der Oberfläche (32a) des Basisstreifens (32) größer als die zuvor bestimmte Fläche der Oberfläche (34a) des Zusatzstreifens (34) ist.

5. Abdichtung gemäß Anspruch 1, wobei einer der mehreren Ränder des Zusatzstreifens (34) im Wesentlichen entlang einem der mehreren Ränder des Basisstreifens (32) ausgerichtet ist.

6. Abdichtung gemäß Anspruch 5, wobei die U-förmige Oberfläche auf dem Basisstreifen (32) einen U-förmigen äußeren Abschnitt (40) und einen U-förmigen inneren Abschnitt (42) aufweist, so dass der U-förmige innere Abschnitt (42) die Vielzahl der mehreren Ränder des Zusatzstreifens (34) umgrenzt.

7. Abdichtung gemäß Anspruch 6, wobei der U-förmige äußere Abschnitt (40) von der Vielzahl der mehreren Ränder des Zusatzstreifens (34) beabstandet ist.

8. Abdichtung gemäß Anspruch 6, wobei die U-förmige Oberfläche des Basisstreifens (32) die faltbare Region (F) in dem U-förmigen äußeren Abschnitt (40) davon und von dem U-förmigen inneren Abschnitt (42) davon beabstandet aufweist.

9. Eine Druckerpatrone (10), beinhaltend:

ein Gehäuse (16) mit einem Behälter zur Aufbewahrung von Toner;
eine Entwicklerwalze (22), die von dem Gehäuse (16) gestützt wird und betriebsfähig ist, Toner aus dem Behälter zu empfangen und den Toner auf eine Fotoleitertrommel zu übertragen;
eine von dem Gehäuse gestützte Rakelanordnung neben der Entwicklerwalze und mit einer Rakel und einer Halterung zum Positionieren der Rakel, um einen Abstand zu der Entwicklerwalze zu bilden, um die Menge an auf die Ent-

wicklerwalze abgegebenem Toner zu steuern, wobei die Halterung auch neben einem Abschnitt des Gehäuses angeordnet ist, so dass zwischen der Halterung und dem Gehäuseabschnitt eine Lücke definiert ist;
wobei die Rakelanordnung eine verstärkte Abdichtung (30) gemäß Anspruch 1 beinhaltet, die durch die Lücke angeordnet ist, um eine Abdichtung der Lücke zwischen der Halterung und dem Gehäuseabschnitt bereitzustellen, um ein mögliches Auslaufen des Toners in einer zuvor bestimmten Fließrichtung durch die Lücke und aus der Druckerpatrone heraus zu verhindern,
wobei der laminierte Abschnitt (36) des Basisstreifens (32) relativ zu der Richtung eines möglichen Tonerauslaufflusses der Lücke vorgelagert eingerichtet ist und der nicht laminierte Abschnitt (38) des Basisstreifens (32) durch die Lücke und relativ zu der Richtung eines möglichen Tonerauslaufflusses der Lücke nachgelagert eingerichtet ist und wobei die Klebschicht (44) auf mindestens einem Abschnitt der Oberfläche auf dem nicht laminierten Abschnitt (38) des Basisstreifens (32) die Anbringung der verstärkten Abdichtung (30) an dem nicht laminierten Abschnitt (38) des Basisstreifens (32) an dem Gehäuse mindestens der Lücke nachgelagert anpasst.

10. Patrone gemäß Anspruch 9, wobei die Dicke des Zusatzstreifens (34) zwischen drei- und viermal größer als die Dicke des Basisstreifens (32) ist.

11. Patrone gemäß Anspruch 9, wobei die flexible Kunststofffolie des Zusatzstreifens (34) ein biaxial orientierter PET-Polyester ist und die flexible Kunststofffolie des Basisstreifens (32) ein biaxial orientierter PET-Polyester ist.

12. Patrone gemäß Anspruch 9, wobei die U-förmige Oberfläche auf dem Basisstreifen (32) einen U-förmigen äußeren Abschnitt (40) und einen U-förmigen inneren Abschnitt (42) aufweist, so dass der U-förmige innere Abschnitt (42) die Vielzahl der mehreren Ränder des Zusatzstreifens (34) umgrenzt.

13. Patrone gemäß Anspruch 12, wobei die U-förmige Oberfläche des Basisstreifens (32) die faltbare Region (F) ausgerichtet nach der Lücke und definiert in dem U-förmigen äußeren Abschnitt (40) des Basisstreifens (32) und beabstandet von dem U-förmigen inneren Abschnitt (42) davon aufweist und wobei sich die Klebschicht (44) auf dem U-förmigen äußeren Abschnitt (40) des Basisstreifens (32) befindet.

Revendications

1. Un joint d'ensemble formant racle renforcé (30), comprenant :

une bande de base (32) en un film plastique souple ayant une épaisseur, une surface (32a) de zone prédéterminée liée par des bords multiples (32b à 32e), et une région pliable (F) s'étendant sur la longueur de ladite bande de base entre une paire (32c, 32d) desdits bords multiples et espacée de et située de façon intermédiaire entre une autre paire (32b, 32e) desdits bords multiples ;
une bande supplémentaire (34) en un film plastique souple ayant une épaisseur et une surface (34a) de zone prédéterminée liée par des bords multiples (34b à 34e) et étant stratifiée sur ledit film plastique souple de ladite bande de base (32) décalée de et le long d'un côté de ladite région pliable sur ladite bande de base (32) de telle sorte que ladite bande de base (32) ait des portions stratifiées (36) et non stratifiées (38) le long de côtés opposés de ladite région pliable (F), l'épaisseur de la portion stratifiée (36) étant plus grande que l'épaisseur de la portion non stratifiée (38) ; et
une couche adhésive (44) sur au moins une section de ladite portion non stratifiée (38) de ladite bande de base (32) s'étendant entre ladite une paire de bords multiples de ladite bande de base (32) ;
caractérisé en ce que lesdits bords multiples de ladite bande de base (32) qui correspondent auxdits bords multiples de ladite bande supplémentaire (34) sont respectivement plus grands en longueur que lesdits bords multiples de ladite bande supplémentaire (34) de telle sorte que ladite surface de ladite bande de base (32) soit substantiellement en forme de U et borde ladite bande supplémentaire (34) le long d'une pluralité desdits bords multiples de ladite bande supplémentaire (34).

2. Le joint de la revendication 1 dans lequel ladite épaisseur de ladite bande supplémentaire (34) est dans les limites d'une gamme de trois à quatre fois plus grande que ladite épaisseur de ladite bande de base (32).

3. Le joint de la revendication 1 dans lequel ledit film plastique souple de ladite bande supplémentaire (34) est un polyester PET orienté de façon biaxiale et ledit film plastique souple de ladite bande de base (32) est un polyester PET orienté de façon biaxiale.

4. Le joint de la revendication 1 dans lequel ladite zone prédéterminée de ladite surface (32a) de ladite ban-

de de base (32) est plus importante que ladite zone prédéterminée de ladite surface (34a) de ladite bande supplémentaire (34).

5. Le joint de la revendication 1 dans lequel un bord parmi lesdits bords multiples de ladite bande supplémentaire (34) est substantiellement aligné le long d'un bord desdits bords multiples de ladite bande de base (32).

6. Le joint de la revendication 5 dans lequel ladite surface en forme de U sur ladite bande de base (32) a une portion externe en forme de U (40) et une portion interne en forme de U (42) de telle sorte que ladite portion interne en forme de U (42) lie ladite pluralité desdits bords multiples de ladite bande supplémentaire (34).

7. Le joint de la revendication 6 dans lequel ladite portion externe en forme de U (40) est espacée de ladite pluralité desdits bords multiples de ladite bande supplémentaire (34).

8. Le joint de la revendication 6 dans lequel ladite surface en forme de U de ladite bande de base (32) a ladite région pliable (F) dans ladite portion externe en forme de U (40) de celle-ci et espacée de ladite portion interne en forme de U (42) de celle-ci.

9. Une cartouche pour imprimante (10), comprenant :

un logement (16) ayant un réservoir pour contenir du toner ;
un rouleau développeur (22) supporté par ledit logement (16) et pouvant fonctionner pour recevoir du toner provenant dudit réservoir et pour transférer le toner vers un tambour photoconducteur ;
un ensemble formant racle supporté par ledit logement adjacent audit rouleau développeur et ayant une racle et une patte pour positionner ladite racle afin de former une zone de pincement avec ledit rouleau développeur pour contrôler la quantité de toner alimentée sur ledit rouleau développeur, ladite patte étant également disposée de façon adjacente à une portion dudit logement de telle sorte qu'un écart soit défini entre ladite patte et ladite portion de logement ;
dans laquelle l'ensemble formant racle comprend un joint renforcé (30) tel que revendiqué dans la revendication 1 disposé à travers ledit écart afin de fournir une fermeture étanche dudit écart entre ladite patte et ladite portion de logement pour empêcher une fuite de toner éventuelle dans une direction d'écoulement prédéterminée à travers ledit écart et à partir de ladite cartouche pour imprimante,
dans laquelle la portion stratifiée (36) de la bande de base (32) est située en amont dudit écart relativement à la direction d'écoulement de fuite de toner éventuelle et la portion non stratifiée (38) de la bande de base (32) est située à traves ledit écart et en aval dudit écart relativement à la direction d'écoulement de fuite de toner éventuelle, et dans laquelle la couche adhésive (44) sur au moins une portion de la surface sur la portion non stratifiée (38) de la bande de base (32) représente une attache dudit joint renforcé (30) au niveau de la portion non stratifiée (38) de ladite bande de base (32) audit logement au moins en aval dudit écart.

10. La cartouche de la revendication 9 dans laquelle l'épaisseur de la bande supplémentaire (34) est dans les limites d'une gamme de trois à quatre fois plus grande que l'épaisseur de la bande de base (32).

11. La cartouche de la revendication 9 dans laquelle le film plastique souple de la bande supplémentaire (34) est un polyester PET orienté de façon biaxiale et le film plastique souple de la bande de base (32) est un polyester PET orienté de façon biaxiale.

12. La cartouche de la revendication 9 dans laquelle la surface en forme de U sur la bande de base (32) a une portion externe en forme de U (40) et une portion interne en forme de U (42) de telle sorte que la portion interne en forme de U (42) lie la pluralité desdits bords multiples de la bande supplémentaire (34).

13. La cartouche de la revendication 12 dans laquelle la surface en forme de U de la bande de base (32) a la région pliable (F) alignée avec l'écart et définie dans la portion externe en forme de U (40) de la bande de base (32) et espacée de la portion interne en forme de U (42) de celle-ci et la couche adhésive (44) est sur la portion externe en forme de U (40) de la bande de base (32).

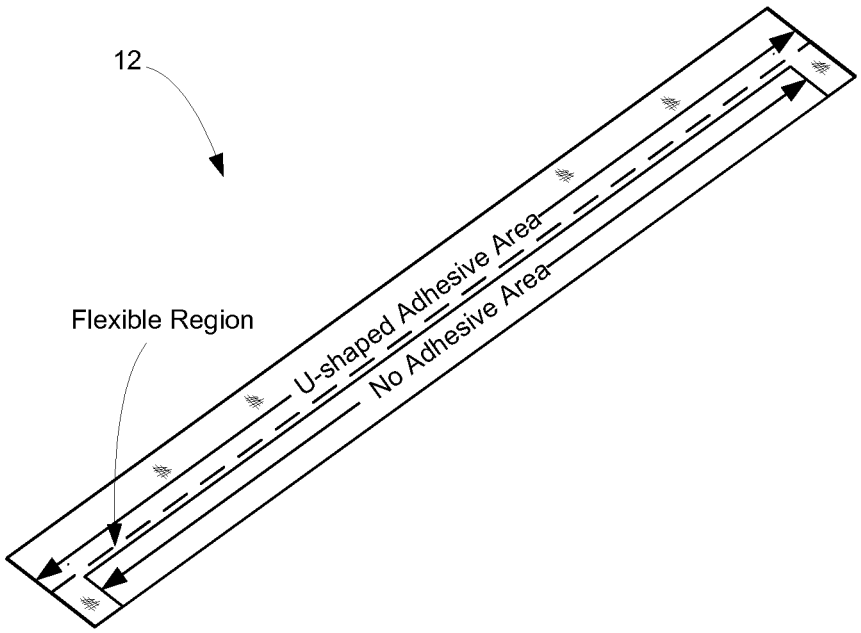


FIG. 1
Prior Art

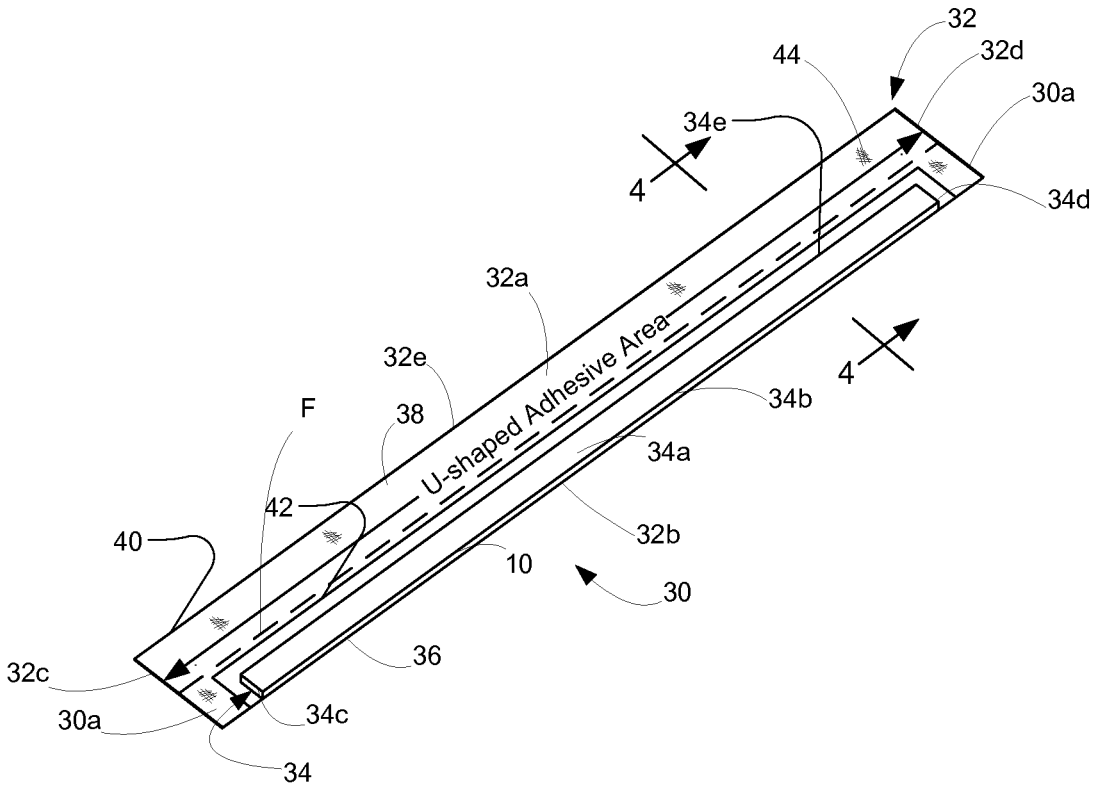


FIG. 3

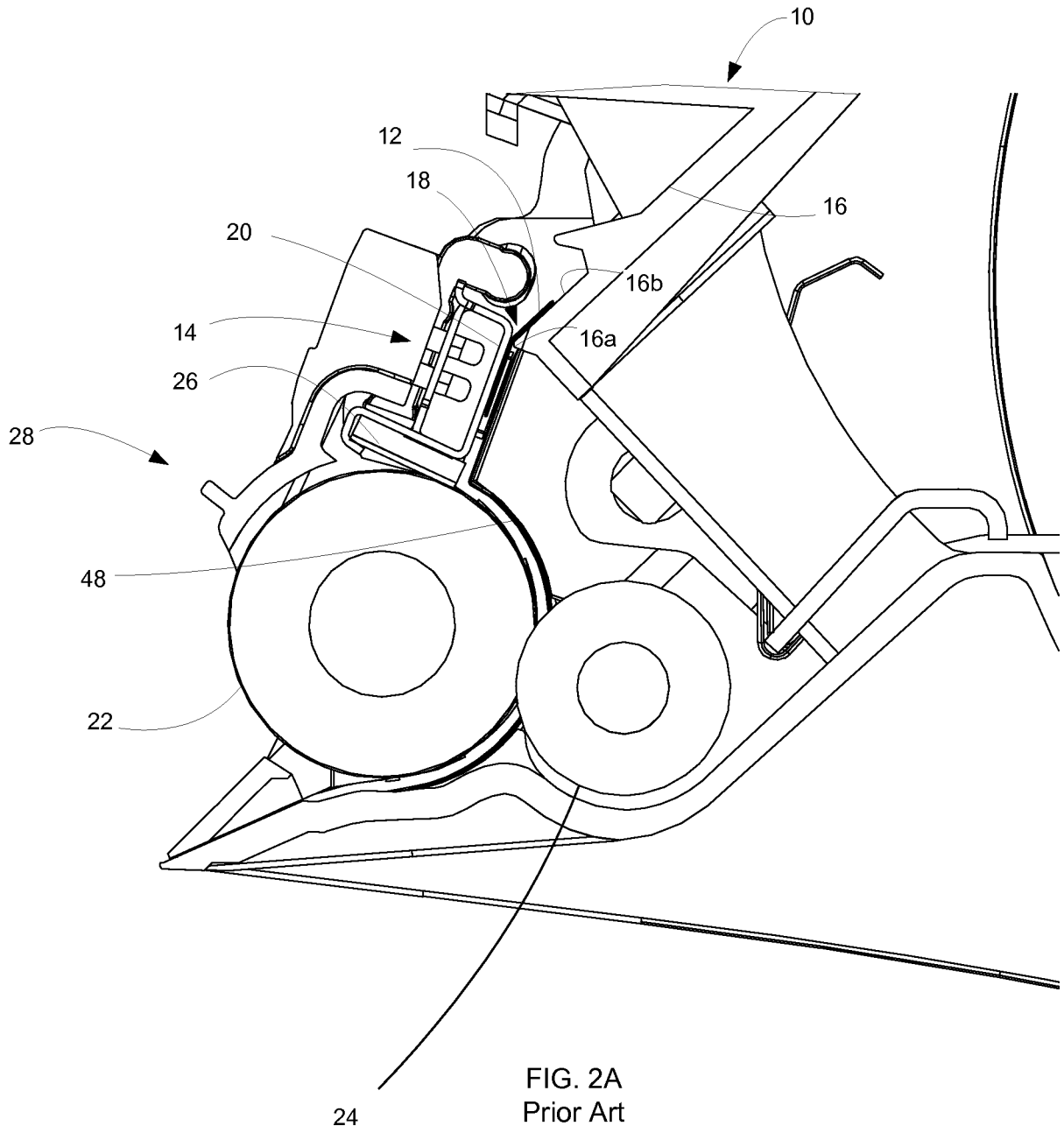


FIG. 2A
Prior Art

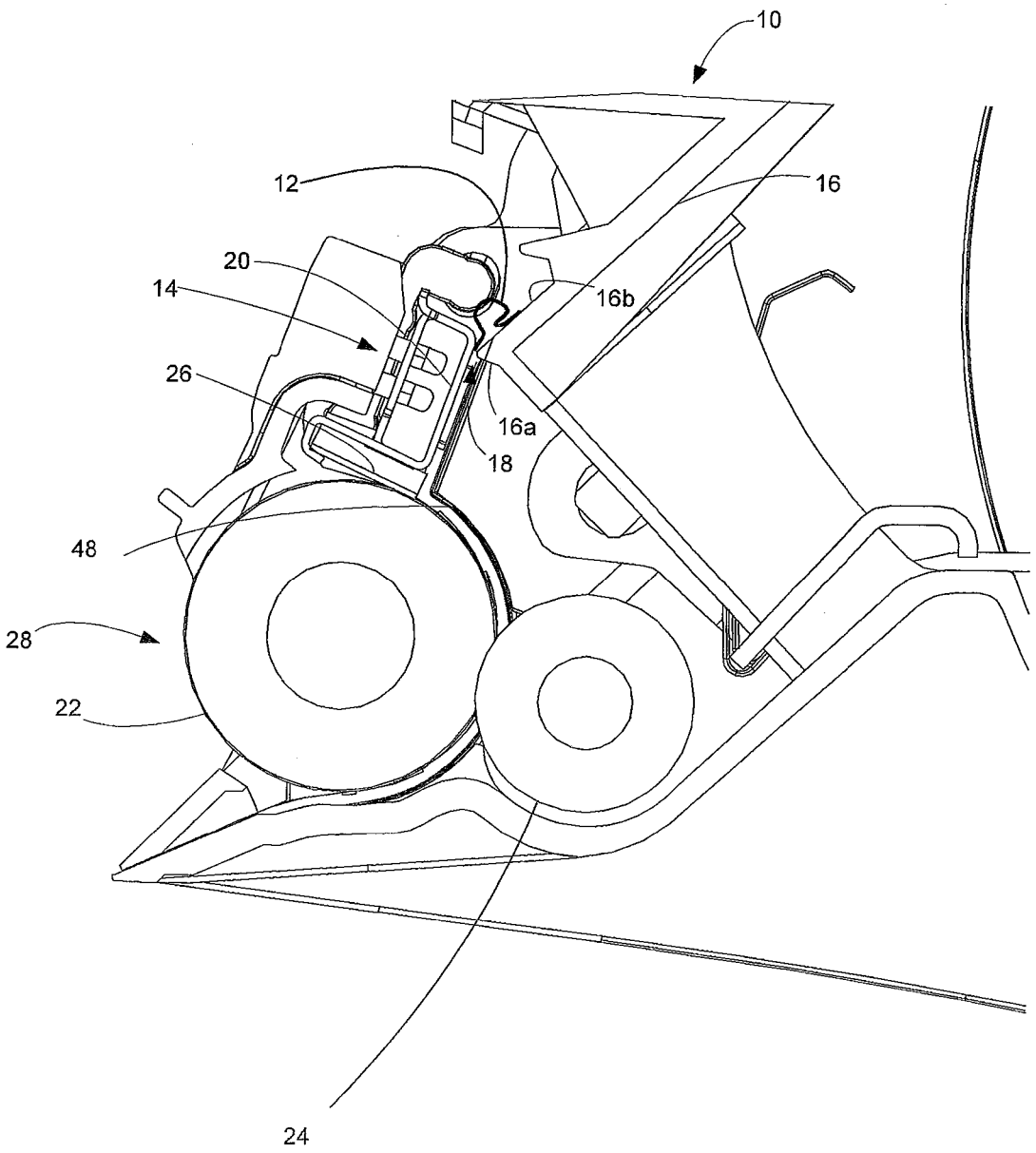


FIG. 2B
PRIOR ART

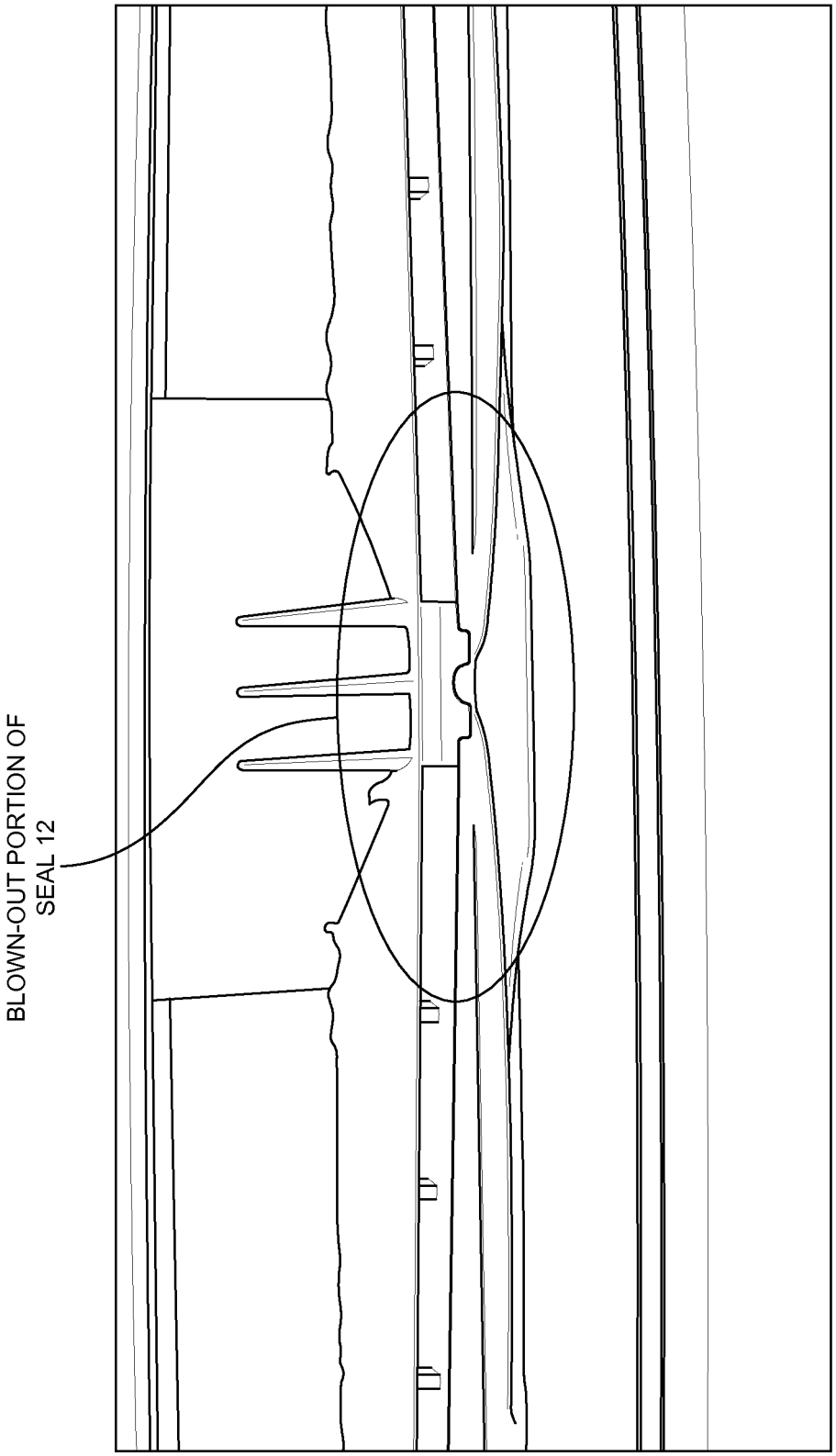


FIG. 2C
Prior Art

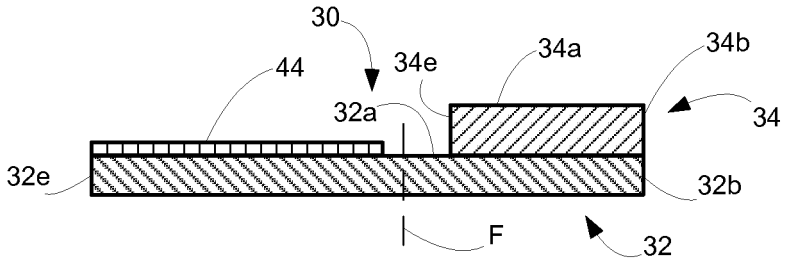


FIG. 4

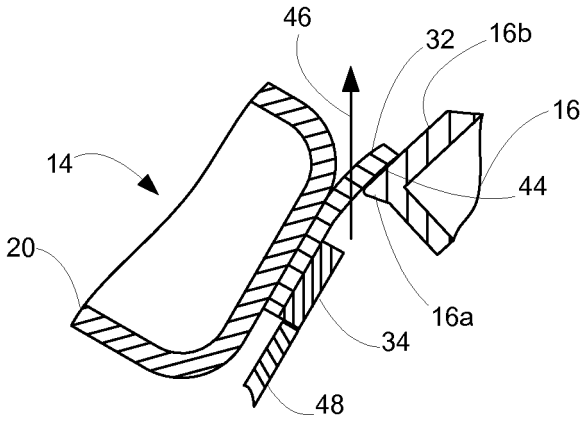


FIG. 5

REFERENCES CITED IN THE DESCRIPTION

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